

DETAILED ACTION

Claim Objections

1. Claims 21, 39 are objected to because of the following informalities:
2. With respect to claim 21 last line; claim 39 lines 20-21: "the end-positioned transducer being positioned at **an end of the signal line**" is objected because the signal line is defined to comprises the first and second electrical port (line 3 of respective claim), and as shown in Figs. 8-10, the ports are the ends of the signal lines and the end-positioned transducer (Figs. 8, 9: MW3; Fig. 10: MW31, MW32) is located in the middle of the signal line, not the end of the signal line. Examiner suggests amending "**an end of the signal line**" into --a signal end of the second partial filter--.
Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.
4. Claims 23, 27, 31, 32, 34-36 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Art Unit: 2817

5. Because of the amendment to claim 21, Examiner believes only Figs. 8-10 can be read on claim 21, thus the following dependent claims appear to introduce new species (i.e. new embodiments) and are viewed as new matter because they do not read on Figs. 8-10 and are not stated by Applicant as obvious features:

- a. With respect to claim 23, in view of the amended parent claim 21, the second electrical port as originally disclosed in Figs. 8-10 (P21, P22), is **not asymmetrical**.
- b. With respect to claim 27, in view of the amended parent claim 21, the first partial filter as originally disclosed in Figs. 8-10 (track with W21, W22) **does not comprise additional serial transducer**.
- c. With respect to claim 31, in view of the amended parent claim 21, the first electrical port as originally disclosed in Figs. 8-10 (P1) **is not** electrically connected to the first partial filter (W21, W22) and the second electrical port as originally disclosed in Figs. 8, 9 (P21, P22) **is not** electrically connected to the end-positioned transducer MW3.
- d. With respect to claims 32, 36, in view of the amended parent claim 21, the first partial filter as originally disclosed in Figs. 8-10 (track with W21, W22) **does not comprise additional acoustic path**.
- e. With respect to claim 34, in view of the amended parent claim 21, the end-positioned transducer as originally disclosed in Figs. 8-10 (MW3, MW31, MW32) **does not comprise at two partial transducers**.

Art Unit: 2817

f. With respect to claim 35, in view of the amended parent claim 21, a signal conducting terminal of the first electrical port as originally disclosed in Figs. 8-10 (P1) **is not** electrically connected to at least one of the first and second serial transducers.

g. With respect to claim 27, in view of the amended parent claim 21, the first partial filter as originally disclosed in Figs. 8, 9 (track with W21, W22) **does not comprises additional serial transducer.**

6. However, if Applicant disagrees that the above noted subject matter is new matter, then Applicant is required to provide an explanation as to why these limitations should not be considered new matter, as well as providing the location(s) in the original specification where there is support for the subject matter in question. Additionally, drawings may be required for the above claims without adding new matter.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 23, 27, 31, 32, 34-36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

9. Claims 23, 27, 31, 32, 34-36 are infinite because the specification do not support the invention as claimed. The claimed inventions appear to be new embodiments that are not disclosed. Accordingly, due to this lack of supporting disclosure, these claims

Art Unit: 2817

fail to particularly point out and distinctly claim subject matter applicant regards as the invention. This is related to the 112-1st Para. Rejection above.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claim 21-24, 26, 28, 29, 31, 32, 37, 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi US 6,380,827 in view of Strauss et al. US 6,081,172 of record.

12. With respect to claim 21, Noguchi discloses an apparatus (Fig. 2; SAW filter, title) comprising: a signal line (from IN to OUT) comprising a first electrical port (IN) and a second electrical port (OUT); a first (205, 204) "partial filter"; a second (206) "partial filter" (since each of items 204-206 are all part of filter 200, thus the items 204-206 read as "partial filter") electrically connected in series with the first partial filter 205 and the second partial filter 206 being between the first (IN) and the second (OUT) electrical ports; and a serial resonator 203 electrically connected (Fig. 2 shows electric lines for the coupling) between the first electrical port IN and an end-positioned transducer 206B ("end-positioned" is interpreted by the examiner as the transducer being located at the end of the signal path of the second partial filter 206), the serial resonator 203 having a constituent transducer (coupled to IN) and reflectors that bound the constituent

Art Unit: 2817

transducer on both sides (see Fig. 2), the reflectors being directly adjacent the constituent transducer (see Fig. 2); wherein: the first partial filter 205 comprises a first serial transducer 205A and a second serial transducer 205C in series branches of the signal line (signal travels along the signal line would pass through transducer 205A and 205C, thus making them in series branch), the first serial transducer 205A and the second serial transducer 205C being in an acoustic path and acoustically coupled with one another (see Fig. 2, the acoustic wave propagates between transducers 205A, 205C along a path of partial filter 205), and the first 205A and second 205C serial transducers being electrically connected in series with respect to the signal line (see Fig. 2, in series branch, thus in series with respect to signal line), and the second partial filter 206 comprises a first coupler transducer 206A (transducer 206A couples to the other track, specifically to transducer 205A, thus transducer 206A is "coupler" transducer) and the end-positioned transducer 206B (transducer 206B is that the end of signal for the 206 filter track, thus it is "end-positioned") that are in DMS path (Col. 5 lines 34-35: partial filter 206 is described as a double mode, which is equivalent to double mode), the end-positioned transducer being positioned at an end (OUT) of the signal line.

Noguchi et al. do not disclose explicitly a piezoelectric substrate.

Strauss et al. exemplary disclose SAW filter on piezoelectric substrate (Fig. 3; Col. 2 lines 43-44).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to have built Noguchi et al.'s SAW filter on a piezoelectric substrate because it is

well known in the art that SAW filter can be built on a piezoelectric substrate as exemplary disclosed by Strauss et al. (Fig. 3, Col. 2 lines 43-44).

13. With respect to claim 22, the combination discloses the first electrical port (IN) comprises an asymmetrical electrical port having a signal conducting terminal (201; asymmetrical because the signal is reference to the ground, as it is shown as single terminal).

14. With respect to claim 23, the combination discloses the second electrical port (OUT) comprises an asymmetrical electrical port having a signal conducting terminal (202; asymmetrical because the signal is reference to the ground, as it is shown as single terminal).

15. With respect to claim 26, the combination discloses each of the acoustic path (of the first partial filter 205) and the DMS path (of the second partial filter 206) are bounded on both sides by reflectors (Fig. 2; 205D, 205E, 206D, 206E).

16. With respect to claims 28, 37, the combination discloses the second partial filter 206 further comprises a second coupler transducer 206C ("coupler transducer" 206 because it is coupled to another track, specifically coupled to transducer 205C).

17. With respect to claim 29, the combination disclose the first 206A and second 206C coupler transducers and the end-positioned transducer 206B in the DMS path are arranged substantially alternately (i.e. 206A, 206B, 206C, in that order).

18. With respect to claim 31, Noguchi discloses the first electrical port (IN) is electrically connected to the first partial filter 205 (through resonator 203); the second electrical port (OUT) is electrically connected to the end-positioned transducer 206B;

and (the top comb bar of) the first coupler transducer 206A is electrically connected in series with (the bottom comb bar of) the first serial transducer 205A.

19. With respect to claim 32, the combination discloses the first partial filter comprises an additional acoustic path (of resonator 204), which is a **separate** path from the path of filter 205 that is electrically connected with the first electrical port (IN; through resonator 203), the additional acoustic path comprising a parallel transducer (of resonator 204) that is electrically connected between the signal line and ground.

20. With respect to claim 38, the combination discloses the end-positioned transducer 206B is between the first 206A and second 206C coupler transducers.

21. With respect to claim 24, the combination discloses the invention above but does not disclose the second electrical port (OUT) comprises a symmetrical electrical port having multiple signal-conducting terminals.

Strauss et al. exemplary disclose in Fig. 1 that for a three transducer track, the center transducer IDT3 can be asymmetrical (INPUT and ground) or symmetrical (sym. INPUT).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to have connected symmetrical electrical port to Noguchi's filter's center transducer 206B instead of asymmetrical port and ground, thereby provided the filter with the ability to process balanced signal as well known in the art.

Response to Arguments/Amendments

22. Applicant's amendments/arguments filed 4/21/2010 have been fully considered but they are not persuasive.

23. Applicant argues the amended claim 21 would read on Fig. 8 with AW31 as the first serial transducer and AW32 as the second serial transducer and being electrically connected in series with respect to the signal line. While transducers AW31, AW32 can individually be viewed as serial transducer as Applicant argued, they cannot be the first and second serial transducers of claim 21. Claim 21 recites DMS path for the second partial filter. The acoustic track that AW31, AW32 resided is a DMS track, which would have to be reserved for the second partial filter with the end-positioned transducer because it is the **ONLY** DMS track on the Figure. Accordingly, transducers AW31, AW32 cannot be the first and second serial transducers as Applicant argued.

24. Applicant also argues transducer W1 is a serial resonator for Fig. 8. Examiner agrees, but note that Examiner's previous assertion in the previous office action mailed on 1/21/2010 was based on Fig. 1.

25. Collectively as a whole, Applicant argues that claim 21 with proper support by viewing transducers AW31 and AW32 as first and second serial resonators respectively and transducer W1 as a serial transducer is disagreed by the Examiner as stated above. However, **in view of the amendment of claim 21**, the Examiner reads claim 21 with proper support on Figs. 8, 9 by viewing terminal P1 as the first electrical port, terminals P21, P22 as the second electrical port, transducers W21, W22 as the first and second serial transducers respectively, transducer W1 as the serial transducer, and

Art Unit: 2817

transducer MW3 as end-positioned transducer; or on Fig. 10 by similar viewing of terminals P1, P21, P22, transducers W21, W22, W1 and with transducers MW31, MW32 as end-positioned transducer. As a result, the 112-rejection on claim 21 has been withdrawn. Note that with this view, some of the dependent claims are not supported, see 112-rejection above.

26. Applicant's arguments/amendment with respect to the rejection(s) under Mita in view of Davenport have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Noguchi, see above.

Allowable Subject Matter

27. Claims 39, 40 are allowed.

28. Claims 25, 30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

29. The following is a statement of reasons for the indication of allowable subject matter:

30. For claims 25, 30, Noguchi/Strauss combination does not disclose a reflector between the first and second serial transducers.

Conclusion

31. Applicant's amendment of claim 21 necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in

Art Unit: 2817

37 CFR 1.136(a). Because the amendment made the first and second serial transducers in series with the signal line, therefore the whole claim structure, including the serial resonator is properly supported by Figs. 8-10 and overcome the rejection of Mita in view of Davenport because the serial resonator with first and second serial transducers as claimed cannot be read. Note that in the prior office action mailed 1/21/2010, Mita in view of Davenport is proper because "serial resonator" had to be read simply as --a resonator-- because there is no "serial resonator" with "first and second serial transducers connected in series in the signal line" disclosed together.

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

32. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Igaki et al. US 7,482,895 and Hartmann et al. US 3,886,504 disclose SAW filter with resonator in between transducers.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALAN WONG whose telephone number is (571)272-3238. The examiner can normally be reached on Mon-Thurs 10am-7:30pm.

Art Unit: 2817

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bob Pascal can be reached on (571) 272-1769. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AW

/Robert Pascal/
Supervisory Patent Examiner, Art Unit 2817